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import random
from datetime import datetime, timedelta
import pandas as pd
from dateutil.parser import parse

class CreatingDB:
    """
    Class for creating random database
    """
    num_people = 0 # number of people to create
    base_date = None # the base date of data

    def __init__(self, num_people, base_date):
        self.num_people = num_people
        self.base_date = base_date

    def generate_incurred_date(self):
        """
        function to create random incurred date
        :return:
            incurred_date: string, the day of infection or contact
            elapsed_days: int, the difference between base date and incurred date
        """
        elapsed_days = random.randint(0, 14) # the valid day period is 0~14
        # extracting the incurred day using periods and base date
        incurred_date = (self.base_date - timedelta(days=elapsed_days)).\
            strftime("%Y %m %d")
        return incurred_date, elapsed_days

    def compute_severity(self, status, elapsed_days):
        """
        function to compute severity
        :param status: string, 'contacted' or 'confirmed'
        :param elapsed_days: the period form the incurred date
        :return: the computed severity using formula
        """
        if status == 'contacted': # contacted person?
            return 1 - (elapsed_days * 0.05)
        else: # confirmed person?
            return (1 - (elapsed_days * 0.05)) * 0.5

    def generate_address_list(self):
        """
        function to get one address randomly from the adress list
        :return: the randomly generated address list
        """
        with open('./Address_Part.txt', 'r', encoding='utf-8') as add_file:
            # add_file = add_file.encoding
            address_list = add_file.readlines()

            random_address_list = [] # list to store addresses

            # extract addresses as many as the number of recipients
            for _ in range(1, self.num_people+1):
                random_address_list.append(random.choice(address_list))

        return random_address_list

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def generate_csv_data(self):
    """
    function to create .csv file with randomly generated records
    :return: None
    """
    num_healthy = round(self.num_people / 3) # 1/3 is healthy
    num_contacted = round(self.num_people / 3) # 1/3 is contacted
    # 1/3 is confirmed
    num_confirmed = self.num_people - num_healthy - num_contacted

    id_list = list(range(1, self.num_people+1)) # ID as many as people
    random.shuffle(id_list) # shuffle list

    # age records as many as people
    age_list = list(random.randint(1, 100)
                     for _ in range(1, self.num_people+1))
    # address records as many as people
    address_list = self.generate_address_list()

    severity_list = [] # severity records as many as people
    incurred_date_list = [] # incurred date list including 'None'(healthy)
    status_list = [] # status(Healthy, Contacted, and Confirmed) list

    # Entire people num = healthy + contacted + confirmed
    # Repeat as many healthy people
    for _ in range(num_healthy):
        severity_list.append(0)
        status_list.append('Healthy')
        incurred_date_list.append('None')

    # Repeat as many contacted people
    for count in range(num_contacted):
        date, days = self.generate_incurred_date()
        status_list.append('Contacted')
        severity_list.append(round(self.compute_severity('contacted', days),
2))
        incurred_date_list.append(date)

    # Repeat as many confirmed people
    for _ in range(num_confirmed):
        date, days = self.generate_incurred_date()
        status_list.append('Confirmed')
        severity_list.append(round(self.compute_severity('confirmed', days),
2))
        incurred_date_list.append(date)

    # converting as pandas DataFrame data type to save .csv
    df = pd.DataFrame({
        "ID": id_list,
        "Age": age_list,
        "Address": address_list,
        "Covid Status": status_list,
        # "Severity": severity_list,
        "Incurred Date": incurred_date_list,
    })
    df = df.sort_values(['ID'], ascending=[True])
    df.reset_index(drop=True, inplace=True)

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    # saving as .csv file
    df.to_csv("corona_data.csv", mode='w', encoding='utf-8-sig')

if __name__ == '__main__':
    # require the number of people and base date
    num_people = int(input("Enter the number of people: "))
    date_input = input("Enter the base date(Year-Month-Day): ")
    if date_input == '':
        print("The base date is set as today.")
        date = datetime.now().date()
    else:
        date = parse(date_input).date()

    cdb = CreatingDB(num_people, date) # creating instance
    cdb.generate_csv_data() # creating .csv file
```